C L A I M S

1. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· a resistor (12) having a first end (12a) connected with the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);
· feedback means (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11), said feedback means (13) being preferably defined either by a single capacitor or by a capacitor in series with a resistor;
- a second stage (20) provided with:
· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);
· a first resistor (22) having a first end (22a) connected with the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);
· a second resistor (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21);
- a third stage (30) provided with:
· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and

an output (31c);

· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· feedback means (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31), said feedback means (33) being preferably defined either by a single capacitor or by a capacitor in series with a resistor;

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a main resistor (60) connected between the inverting input (11a) of said first operational amplifier (11) and a fixed-potential node, preferably a grounded node, and/or an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node.

2. A filter as claimed in claim 1, characterised in that it further comprises a direct connection (72) between the inverting input (31a) of said third operational amplifier (31) and the noninverting input (11b) of said first operational amplifier (11).

3. A filter as claimed in claim 1, characterised in that it further comprises a direct connection (70) between the inverting input (21a) of said second

operational amplifier (21) and the noninverting input (11b) of said first operational amplifier (11).

4. A filter as claimed in claim 1, 2 or 3, characterised in that it further comprises a feedback branch (71) preferably defined by a short circuit or by amplifying means and having a first end (71a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (71b) connected to the noninverting input (21b) of said second operational amplifier (21).

5. A filter as claimed in claim 4, characterised in that said amplifying means has an input connected to the first end (71a) of said feedback branch (71) and an output connected to the second end (71b) of the same branch (71), the inverting input (11a) of said first operational amplifier (11) being connected to a fixed-potential node, preferably a grounded node, through said main resistor (60).

6. A filter as claimed in claim 1 or 3, characterised in that it further comprises a direct connection (76) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31), the inverting input (31a) of said third operational amplifier (31) being connected to a fixed-potential node, preferably a grounded node, through said auxiliary resistor (61).

7. A filter as claimed in claim 1 or 2, characterised in that it further comprises a direct connection (76) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input

(31b) of said third operational amplifier (31).

8. A filter as claimed in claim 1 or 2, characterised in that it further comprises a direct connection (73) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21), the inverting input (11a) of said first operational amplifier (11) being connected to a fixed-potential node, preferably a grounded node, through said main resistor (60).

9. A filter as claimed in anyone of the preceding claims, characterised in that the feedback means (33) of said third stage (30) is defined by a branch comprising either a single capacitor or a capacitor in series with a resistor, said branch being connected in parallel to another branch comprising either a single resistor or a resistor in series with a capacitor, or in that it further comprises a feedback resistor (74) having a first end (74a) connected with the inverting input (11a) of said first operational amplifier (11) and a second end (74b) connected with the output (11c) of said first operational amplifier (11) or the output (21c) of said second operational amplifier (21).

10. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· a resistor (12) having a first end (12a) connected with the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);

· feedback means (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11), said feedback means (13) being preferably defined either by a single capacitor or by a capacitor in series with a resistor;

- a second stage (20) provided with:

· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);

· a first resistor (22) having a first end (22a) connected with the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);

· a second resistor (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21);

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· feedback means (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31), said feedback means (33) being preferably defined either by a single capacitor or by a

capacitor in series with a resistor;
- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),
characterised in that it further comprises a fourth stage (40) provided with:
- a fourth operational amplifier (41) having an inverting input (41a) directly connected to the noninverting input (21b) of said second operational amplifier (21) or the noninverting input (31b) of said third operational amplifier (31), a noninverting input (41b) and an output (41c);
- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to the output (31c) of said third operational amplifier (31);
- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

11. A filter as claimed in claim 10, characterised in that it further comprises a direct connection (76) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31).

12. A filter as claimed in claim 10 or 11, characterised in that it further comprises a secondary resistor (62) connected between the inverting input (21a) of said second operational amplifier (21) and a

fixed-potential node, preferably a grounded node, and/or in that the noninverting input (41b) of said fourth operational amplifier (41) is directly connected with the inverting input (11a) of said first operational amplifier (11), or with a fixed-potential node, preferably a grounded node, the inverting input (41a) of said fourth operational amplifier (41) being in addition directly connected to the noninverting input (21b) of said second operational amplifier (21).

13. A filter as claimed in claim 10, characterised in that it further comprises a direct connection (75) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (11b) of said first operational amplifier (11).

14. A filter as claimed in claim 10, characterised in that it further comprises a direct connection (77) between the inverting input (31a) of said third operational amplifier (31) and the noninverting input (11b) of said first operational amplifier (11).

15. A filter as claimed in claim 10, 13 or 14, characterised in that the noninverting input (41b) of said fourth operational amplifier (41) is directly connected to the inverting input (21a) of said second operational amplifier (21) and/or in that it further comprises an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node, the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (31b) of said third operational amplifier (31).

16. A filter as claimed in anyone of claims 10 to 15, characterised in that the feedback means (33) of said third stage (30) is preferably defined by a branch comprising either a single capacitor or a capacitor in series with a resistor, this branch being parallel-connected to another branch comprising either a single resistor or a resistor in series with a capacitor, or in that it further comprises a feedback resistor (74) having a first end (74a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (74b) connected to the output (11c) of said first operational amplifier (11) or the output (21c) of said second operational amplifier (21).

17. An active filter comprising:

- a first stage (10) provided with:

· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);

· a resistor (12) having a first end (12a) connected with the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);

· feedback means (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11), said feedback means (13) being preferably defined either by a single capacitor or by a capacitor in series with a resistor;

- a second stage (20) provided with:

· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);

· a first resistor (22) having a first end (22a)

connected with the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);

· a second resistor (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21);

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· feedback means (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31), said feedback means (33) being preferably defined either by a single capacitor or by a capacitor in series with a resistor;

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a fourth stage (40) provided with:

- a fourth operational amplifier (41) having an inverting input (41a), a noninverting input (41b) and an output (41c), said inverting input (41a) being directly connected with the noninverting input (11b) of

said first operational amplifier (11) or the noninverting input (21b) of said second operational amplifier (21);

- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to the output (21c) of said second operational amplifier (21);

- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

18. A filter as claimed in claim 17, characterised in that it further comprises a main resistor (60) having a first end (60a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (60b) connected to a fixed-potential node, preferably a grounded node.

19. A filter as claimed in claim 17 or 18, characterised in that it further comprises a direct connection (18) between the inverting input (31a) of said third operational amplifier (31) and the noninverting input (11b) of said first operational amplifier (11), the noninverting input (41b) of said fourth operational amplifier (41) being connected to a fixed-potential node, preferably a grounded node, the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (21b) of said second operational amplifier (21).

20. A filter as claimed in claim 17, characterised in

that it is further provided with a direct connection (82) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (41b) of said fourth operational amplifier (41), the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (21b) of said second operational amplifier (21).

21. A filter as claimed in claim 17 or 18, characterised in that it further comprises a direct connection (84) between the inverting input (31a) of said third operational amplifier (31) and the noninverting input (41b) of said fourth operational amplifier (41).

22. A filter as claimed in claim 17, 18 or 21, characterised in that it further comprises a direct connection (85) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21), the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (11b) of said first operational amplifier (11).

23. A filter as claimed in claim 17, 18 or 21, characterised in that it further comprises a direct connection (87) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (11b) of said first operational amplifier (11), the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (21b) of said second operational amplifier (21).

24. A filter as claimed in anyone of claims 17, 18, 20, 21 and 22, characterised in that it further comprises a secondary resistor (62) having a first end (62a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (62b) connected to a fixed-potential node, preferably a grounded node.

25. A filter as claimed in anyone of claims 17 to 24, characterised in that it further comprises a feedback resistor (74) having a first end (74a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (74b) connected to the output (11c) of said first operational amplifier (11) or the output (21c) of said second operational amplifier (21).

26. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· a resistor (12) having a first end (12a) connected with the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);
· feedback means (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11), said feedback means (13) being preferably defined either by a single capacitor or by a capacitor in series with a resistor;
- a second stage (20) provided with:
· a second operational amplifier (21), having an

inverting input (21a), a noninverting input (21b) and an output (21c);

· a first resistor (22) having a first end (22a) connected with the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);

· a second resistor (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21);

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· feedback means (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31), said feedback means (33) being preferably defined either by a single capacitor or by a capacitor in series with a resistor;

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a fourth stage (40) provided with:

- a fourth operational amplifier (41) having a

noninverting input (41b) directly connected to the inverting input (21a) of said second operational amplifier (21) or to the inverting input (31a) of said third operational amplifier (31), an inverting input (41a) and an output (41c);

- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b);

- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41), and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

27. A filter as claimed in claim 26, characterised in that the second end (42b) of the first resistor (42) of said fourth stage (40) is connected to the output (11c) of said first operational amplifier (11), and/or in that it is further provided with a direct connection between the inverting input (41a) of said fourth operational amplifier (41) and the noninverting input (31b) of said third operational amplifier (31), and/or with a direct connection (90) between the inverting input (31a) of said third operational amplifier (31) and the noninverting input (11b) of said first operational amplifier (11), the noninverting input (41b) of said fourth operational amplifier (41) being directly connected to the inverting input (21a) of said second operational amplifier (21).

28. A filter as claimed in claim 26, characterised in that the second end (42b) of the first resistor (42) of said fourth stage (40) is connected to the output (11c) of said first operational amplifier (11), and/or in that the inverting input (41a) of said fourth

operational amplifier (41) is directly connected to the noninverting input (11b) of said first operational amplifier (11), the noninverting input (41b) of said fourth operational amplifier (41) being directly connected to the inverting input (31a) of said third operational amplifier (31).

29. A filter as claimed in claim 26, characterised in that the second end (42b) of the first resistor (42) of said fourth stage (40) is connected to a fixed-potential node, preferably a grounded node, and/or in that the output (41c) of said fourth operational amplifier (41) is connected, preferably in a direct manner, to the noninverting input (11b) of said first operational amplifier (11) and/or to the noninverting input (31b) of said third operational amplifier (31), the noninverting input (41b) of said fourth operational amplifier (41) being directly connected to the inverting input (21a) of said second operational amplifier (21).

30. A filter as claimed in claim 26, characterised in that the second end (42b) of the first resistor (42) of said fourth stage (40) is connected to a fixed-potential node, preferably a grounded node, and/or in that it is further provided with a direct connection (90) between the inverting input (31a) of said third operational amplifier (31) and the noninverting input (11b) of said first operational amplifier (11), and/or with a preferably direct connection between the output (41c) of said fourth operational amplifier (41) and the noninverting input (31b) of said third operational amplifier (31), the noninverting input (41b) of said fourth operational amplifier (41) being directly connected to the inverting input (21a) of said second

operational amplifier (21).

31. A filter as claimed in claim 26, characterised in that the second end (42b) of the first resistor (42) of said fourth stage (40) is connected to a fixed-potential node, preferably a grounded node, and/or in that it is further provided with a direct connection (71) between the inverting input (31a) of said third operational amplifier (31) and the noninverting input (21b) of said second operational amplifier (21), and/or with a preferably direct connection between the output (41c) of said fourth operational amplifier (41) and the noninverting input (11b) of said first operational amplifier (11), the noninverting input (41b) of said fourth operational amplifier (41) being directly connected to the inverting input (21a) of said second operational amplifier (21).

32. A filter as claimed in anyone of claims 26 to 31, characterised in that the feedback means (33) of said third stage (30) is defined by a branch comprising either a single capacitor or a capacitor in series with a resistor, this branch being connected in parallel to another branch comprising a single resistor or a resistor in series with a capacitor, or in that it further comprises a feedback resistor (74) having a first end (74a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (74b) connected to the output (11c) of said first operational amplifier (11) or to the output (21c) of said second operational amplifier (21).

33. A filter as claimed in anyone of claims 26 to 32, characterised in that it further comprises a main resistor (60) connected between the inverting input

(11a) of said first operational amplifier (11) and a fixed-potential node, preferably a grounded node, and/or in that it further comprises an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node.

34. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· a resistor (12) having a first end (12a) connected with the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);
· a second resistor (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected to the output (11c) of said first operational amplifier (11);
- a second stage (20) provided with:
· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);
· a resistor (22) having a first end (22a) connected with the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);
· feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21), said feedback means (23)

preferably comprising either a single capacitor or a capacitor in series with a resistor;

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· feedback means (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31), said feedback means (33) being preferably defined either by a single capacitor or by a capacitor in series with a resistor;

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it is further provided with an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node, and/or with a secondary resistor (62) connected between the inverting input (21a) of said second operational amplifier (21) and a fixed-potential node, preferably a grounded node.

35. A filter as claimed in claim 34, characterised in that it further comprises a fourth stage (40) provided with:

- a fourth operational amplifier (41) having an

inverting input (41a), a noninverting input (41b) and an output (41c);

- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to the output (21c) of said second operational amplifier (21);

- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

36. A filter as claimed in claim 34 or 35, characterised in that it further comprises a feedback branch (103) having a first end (103a) connected to the output (21c) of said second operational amplifier (21) and a second end (103b) connected to the inverting input (11a) of said first operational amplifier (11), said feedback branch (103) being preferably defined by a feedback resistor (104).

37. A filter as claimed in anyone of claims 34, 35 and 36, characterised in that it further comprises a feedback branch (101) having a first end (101a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (101b) connected to the output (11c) of said first operational amplifier (11), said feedback branch (101) being preferably defined by a feedback resistor (102) having a first end (102a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (102b) connected to the output (11c) of said first operational amplifier (11).

38. A filter as claimed in claim 35, characterised in that it further comprises a feedback resistor (104) connected between the output (41c) of said fourth operational amplifier (41) and the inverting input (11a) of said first operational amplifier (11).

39. A filter as claimed in claim 34 or 35, characterised in that the feedback means (23) of said second stage (20) or the feedback means (33) of said third stage (30) is preferably defined by a branch comprising a capacitor and a resistor connected in series with each other, this branch being connected in parallel to a capacitor or to another branch of the same circuit type as the preceding one.

40. A filter as claimed in claim 34 or 35, characterised in that the feedback means (23) of said second stage (20) is preferably defined by a resistor connected in parallel to a branch comprising either a single capacitor or a capacitor in series with a resistor, said filter (1) being further preferably provided with a feedback branch (108), in particular defined by a feedback resistor (109), and having a first end (108a) connected to the output (31c) of said third operational amplifier (31) and a second end (108b) connected to the inverting input (21a) of said second operational amplifier (21).

41. A filter as claimed in anyone of claims 35 to 40, characterised in that the noninverting input (41b) of said fourth operational amplifier (41) is directly connected to the inverting input (21a) of said second operational amplifier (21).

42. A filter as claimed in claim 34, 35 or 41 when

depending on claim 35, characterised in that it further comprises a feedback resistor (106) having a first end (106a) connected to the output (21c) of said second operational amplifier (21) and a second end (106b) connected to the noninverting input (11b) of said first operational amplifier (11).

43. A filter as claimed in anyone of claims 35 to 40, characterised in that the noninverting input (41b) of said fourth operational amplifier (41) is directly connected to the inverting input (31a) of said third operational amplifier (31).

44. A filter as claimed in anyone of claims 34 to 39, or as claimed in claim 41 when depending on claim 35, 36, 37, 38 or 39, characterised in that it is further provided with a direct connection (107) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (11b) of said first operational amplifier (11), or in that it is further provided with a resistor (105) connected between the noninverting input (11b) of said first operational amplifier (11) and a fixed-potential node, preferably a grounded node, and with a feedback resistor (106) having a first end (106a) connected to the output (21c) of said second operational amplifier (21) and a second end (106b) connected to the noninverting input (11b) of said first operational amplifier (11), said filter (1) being further preferably provided with a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31), the inverting input (31a) of said third operational amplifier (31) being connected to a fixed-potential

node, preferably a grounded node, through said auxiliary resistor (61).

45. A filter as claimed in anyone of claims 34 to 41, characterised in that it further comprises a feedback branch (107), in particular defined by a direct connection or by amplifying means and having a first end (107a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (107b) connected to the noninverting input (11b) of said first operational amplifier (11), said amplifying means having an input connected to the first end (107a) of said feedback branch (107) and an output connected to the second end (107b) of the same branch (107), and/or in that it also comprises a direct connection (203) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (31b) of said third operational amplifier (31), the inverting input (31a) of said third operational amplifier (31) being connected to a fixed-potential node, preferably a grounded node, through said auxiliary resistor (61).

46. A filter as claimed in anyone of claims 34 to 40, or as claimed in claim 43, characterised in that it further comprises a direct connection (204) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21), and/or in that it further comprises a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31).

47. A filter as claimed in anyone of claims 34 to 40 or

as claimed in claim 43, characterised in that it further comprises a direct connection (204) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21) and/or in that it further comprises a direct connection (203) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (31b) of said third operational amplifier (31), the inverting input (21a) of said second operational amplifier (21) being connected to a fixed-potential node, preferably a grounded node, through said secondary resistor (62).

48. A filter as claimed in anyone of claims 34 to 42, characterised in that it further comprises a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31), and/or in that it further comprises a connecting branch (110) which is preferably defined by a resistor (11) or by a direct connection (207), and has a first end (110a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (110b) connected to the noninverting input (11b) of said first operational amplifier (11), the inverting input (31a) of said third operational amplifier (31) being connected to a fixed-potential node, preferably a grounded node, through said auxiliary resistor (61).

49. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);

· a resistor (12) having a first end (12a) connected with the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);

· a second resistor (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11);

- a second stage (20) provided with:

· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);

· a resistor (22) having a first end (22a) connected with the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);

· feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21), said feedback means (23) preferably comprising either a single capacitor or a capacitor in series with a resistor;

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· feedback means (33) having a first end (33a) connected to the inverting input (31a) of said third

operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31), said feedback means (33) being preferably defined either by a single capacitor or by a capacitor in series with a resistor;

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a fourth stage (40) provided with:

- a fourth operational amplifier (41) having an inverting input (41a), a noninverting input (41b) and an output (41c), said inverting input (41a) being connected to the noninverting input (11b, 21b or 31b) of one of said first, second and third operational amplifiers (11, 21, 31), either directly or through a resistor;
- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b);
- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

50. A filter as claimed in claim 49, characterised in that it further comprises a feedback branch (103) having a first end (103a) connected to the output (21c) of said second operational amplifier (21) and a second end (103b) connected to the inverting input (11a) of said first operational amplifier (11), said feedback branch (103) being preferably defined by a feedback

resistor (104).

51. A filter as claimed in claim 49 or 50, characterised in that it further comprises a feedback branch (101) having a first end (101a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (101b) connected to the output (11c) of said first operational amplifier (11), said feedback branch (101) being preferably defined by a feedback resistor (102) having a first end (102a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (102b) connected to the output (11c) of said first operational amplifier (11).

52. A filter as claimed in claim 49, characterised in that the feedback means (23) of said second stage (20) or the feedback means (33) of said third stage (30) is preferably defined by a branch comprising a capacitor and a resistor connected to each other in series, this branch being parallel-connected to a capacitor or to another branch of the same circuit type as the preceding one.

53. A filter as claimed in claim 49, characterised in that the feedback means (23) of said second stage (20) is defined by a resistor connected in parallel to a branch comprising either a single capacitor or a capacitor in series with a resistor, said filter (1) being further preferably provided with a feedback branch (108) in particular defined by a feedback resistor (109) and having a first end (108a) connected to the output (31c) of said third operational amplifier (31) and a second end (108b) connected to the inverting input (21a) of said second operational amplifier (21).

54. A filter as claimed in anyone of claims 49 to 53, characterised in that the second end (42b) of the first resistor (42) of said fourth stage (40) is connected with the output (31c) of said third operational amplifier (31).

55. A filter as claimed in claim 54, characterised in that it is further provided with a secondary resistor (62) connected between the inverting input (21a) of said second operational amplifier (21) and a fixed-potential node, preferably a grounded node, and/or with an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node, and/or in that it is further provided with a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31) and/or with a direct connection (218) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (41b) of said fourth operational amplifier (41), the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (21b) of said second operational amplifier (21).

56. A filter as claimed in claim 54, characterised in that the noninverting input (41b) of said fourth operational amplifier (41) is directly connected to the inverting input (21a) of said second operational amplifier (21) and/or in that it further comprises an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node,

the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (31b) of said third operational amplifier (31).

57. A filter as claimed in anyone of claims 49 to 52, characterised in that the second end (42b) of the first resistor (42) of said fourth stage (40) is connected to the output (11c) of said first operational amplifier (11).

58. A filter as claimed in claim 57, characterised in that the noninverting input (41b) of said fourth operational amplifier (41) is connected to a fixed-potential node, preferably a grounded node, and/or in that it is further provided with an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node, and/or with a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31), the inverting input (41a) of said fourth operational amplifier (41) being connected to the noninverting input (11b) of said first operational amplifier (11), either directly or through a resistor.

59. A filter as claimed in claim 57, characterised in that the inverting input (31a) of said third operational amplifier (31) is directly connected to the noninverting input (41b) of said fourth operational amplifier (41) and/or in that it further comprises a main resistor (60) connected between the inverting input (11a) of said first operational amplifier (11) and a fixed-potential node, preferably a grounded node,

the inverting input (41a) of said fourth operational amplifier (41) being connected to the noninverting input (11b) of said first operational amplifier (11), either directly or through a resistor.

60. A filter as claimed in claim 57, characterised in that it is further provided with a main resistor (60) connected between the inverting input (11a) of said first operational amplifier (11) and a fixed-potential node, preferably a grounded node, or with an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node, and/or in that it is further provided with a direct connection between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (41b) of said fourth operational amplifier (41), and/or with a connecting branch (110) preferably defined by a resistor (111) or by a direct connection (207) and having a first end (110a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (110b) connected with the inverting input (11b) of said first operational amplifier (11), the inverting input (41a) of said fourth operational amplifier (41) being directly connected with the noninverting input (31b) of said third operational amplifier (31).

61. A filter as claimed in claim 49, or as claimed in anyone of claims 57 to 60, characterised in that it further comprises a feedback resistor (106) having a first end (106a) connected to the output (21c) of said second operational amplifier (21) and a second end (106b) connected to the noninverting input (11b) of said first operational amplifier (11).

62. A filter as claimed in anyone of claims 49 to 52, characterised in that the second end (42b) of the first resistor (42) of said fourth stage (40) is connected to the output (21c) of said second operational amplifier (21).

63. A filter as claimed in claim 62, when depending on claim 49, characterised in that it further comprises a feedback resistor (104) connected between the output (41c) of said fourth operational amplifier (41) and the inverting input (11a) of said first operational amplifier (11).

64. A filter as claimed in claim 62 or 63, characterised in that it is further provided with a direct connection (203) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (31b) of said third operational amplifier (31) and/or in that it is also provided with a secondary resistor (62) connected between the inverting input (21a) of said second operational amplifier (21) and a fixed-potential node, preferably a grounded node, and/or with a direct connection (218) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (41b) of said fourth operational amplifier (41), the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (21b) of said second operational amplifier (21).

65. A filter as claimed in claim 62 or 63, characterised in that it is further provided with a main resistor (60) connected between the inverting input (11a) of said first operational amplifier (11)

and a fixed-potential node, preferably a grounded node, or with a second resistor (62) connected between the inverting input (21a) of said second operational amplifier (21) and a fixed-potential node, preferably a grounded node, and/or in that it is further provided with a direct connection (204) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21) and/or with a direct connection between the noninverting input (41b) of said fourth operational amplifier (41) and a fixed-potential node, preferably a grounded node, or the inverting input (31a) of said third operational amplifier (31), the inverting input (41a) of said fourth operational amplifier (41) being directly connected with the noninverting input (11b) of said first operational amplifier (11).

66. A filter as claimed in claim 62 or 63, characterised in that it is further provided with a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31), and/or in that it is also provided with a secondary resistor (62) connected between the inverting input (21a) of said second operational amplifier (21) and a fixed-potential node, preferably a grounded node, and/or with a direct connection (218) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (41b) of said fourth operational amplifier (41), the inverting input (41a) of said fourth operational amplifier (41) being connected to the noninverting input (21b) of said second operational amplifier (21).

67. A filter as claimed in claim 57, characterised in that the noninverting input (41b) of said fourth operational amplifier (41) is directly connected to the inverting input (21a) of said second operational amplifier (21) and/or in that it is further provided with an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node, and/or with a direct connection (203) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (31b) of said third operational amplifier (31), the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (11b) of said first operational amplifier (11).

68. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· a first resistor (12) having a first end (12a) connected with the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);
· a second resistor (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11);
- a second stage (20) provided with:
· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);

· a resistor (22) having a first end (22a) connected with the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);

· feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21), said feedback means (23) being preferably defined either by a single capacitor or by a capacitor in series with a resistor;

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· feedback means (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31), said feedback means (33) being preferably defined either by a single capacitor or by a capacitor in series with a resistor;

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a fourth stage (40) provided with:

- a fourth operational amplifier (41) having an

inverting input (41a), a noninverting input (41b) and an output (41c);

- a direct connection (218) between the inverting input (11a) of said first operational amplifier (11) and a noninverting input (41b) of said fourth operational amplifier (41);

- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to a fixed-potential node, preferably a grounded node;

- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

69. A filter as claimed in claim 68, characterised in that it further comprises a feedback branch (103) having a first end (103a) connected to the output (21c) of said second operational amplifier (21) and a second end (103b) connected to the inverting input (11a) of said first operational amplifier (11), said feedback branch (103) being preferably defined by a feedback resistor (104).

70. A filter as claimed in claim 68 or 69, characterised in that it further comprises a feedback branch (101) having a first end (101a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (101b) connected to the output (11c) of said first operational amplifier (11), said feedback branch (101) being preferably defined by a first end (102a) connected to the inverting input (31a) of said third operational amplifier (31), and a

second end (102b) connected to the output (11c) of said first operational amplifier (11).

71. A filter as claimed in claim 68, characterised in that the feedback means (23) of said second stage (20) or the feedback means (33) of said third stage (30) is defined by a branch comprising a capacitor and a resistor connected in series with each other, this branch being connected in parallel to a capacitor or to another branch of the same circuit type as the preceding one.

72. A filter as claimed in claim 68, characterised in that the feedback means (23) of said second stage (20) is preferably defined by a resistor connected in parallel to a branch comprising either a single capacitor or a capacitor in series with a resistor, said filter (1) being in addition preferably provided with a feedback resistor (109) connected between the output (31c) of said third operational amplifier (31) and the inverting input (21a) of said second operational amplifier (21).

73. A filter as claimed in anyone of claims 68 to 72, characterised in that it is further provided with an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node, and/or with a secondary resistor (62) connected between the inverting input (21a) of said second operational amplifier (21) and a fixed-potential node, preferably a grounded node, and/or in that it is also provided with a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational

amplifier (31) and/or with a preferably direct connection between the output (41c) of said fourth operational amplifier (41) and the noninverting input (21b) of said second operational amplifier (21).

74. A filter as claimed in anyone of claims 68 to 72, characterised in that the output (42c) of said fourth operational amplifier (41) is connected, preferably in a direct manner, with the noninverting input (31b) of said third operational amplifier (31) and/or in that it is also provided with an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node, and/or with a direct connection (107) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (11b) of said first operational amplifier (11).

75. A filter as claimed in anyone of claims 68 to 72, characterised in that it further comprises a secondary resistor (62) connected between the inverting input (21a) of said second operational amplifier (21) and a fixed-potential node, preferably a grounded node, and/or in that the output (41c) of said fourth operational amplifier (41) is preferably connected in a direct manner to the noninverting input (21b) of said second operational amplifier (21) and/or to the noninverting input (31b) of said third operational amplifier (31).

76. An active filter comprising:

- a first stage (10) provided with:

· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and

an output (11c);

· a first resistor (14) having a first end (14a) connected with the noninverting input (11b) of said first operational amplifier (11) and a second end (14b) set to receive an input signal (Vs);

· a second resistor (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11);

- a third resistor (53) having a first end (53a) connected to the noninverting input (11b) of said first operational amplifier (11) and a second end (53b) connected to a fixed-potential node, preferably a grounded node;

- a second stage (20) provided with:

· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);

· a resistor (22) having a first end (22a) connected with the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);

· feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21), said feedback means (23) being preferably defined by a single capacitor or a capacitor in series with a resistor;

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· feedback means (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31), said feedback means (33) preferably comprising a single capacitor or a capacitor in series with a resistor;

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a fourth stage (40) provided with:

- a fourth operational amplifier (41) having:

· an output (41c) connected, preferably in a direct manner, with the noninverting input (21b) of said second operational amplifier (21) and/or with the noninverting input (31b) of said third operational amplifier (31);

· a noninverting input (41b) connected to the inverting input (11a) of said first operational amplifier (11) through a resistor (57);

· an inverting input (41a);

- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to the noninverting input (11b) of said first operational amplifier (11);

- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth

operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

77. A filter as claimed in claim 76, characterised in that the feedback means (23) of said second stage (20) or the feedback means (33) of said third stage (30) is defined by a branch comprising a capacitor and a resistor in series with each other, this branch being parallel-connected to a capacitor or to another branch of the same circuit type as the preceding one.

78. A filter as claimed in claim 76, characterised in that it is further provided with a connecting resistor (52) having a first end (52a) connected to the noninverting input (11b) of said first operational amplifier (11) and a second end (52b) connected to the output (21c) of said second operational amplifier (21), or in that it is further provided with a feedback resistor (104) connected between the inverting input (11a) of said first operational amplifier (11) and the output (21c) of said second operational amplifier (21), and/or with a feedback resistor (102) connected between the inverting input (31a) of said third operational amplifier (31) and the output (11c) of said first operational amplifier (11).

79. A filter as claimed in claim 76, 77 or 78, characterised in that it further comprises a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31), the output (41c) of said fourth operational amplifier (41) being preferably directly connected to the noninverting input (21b) of said

second operational amplifier (21).

80. A filter as claimed in claim 76, 77 or 78, characterised in that it is further provided with an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node, and/or in that it is also provided with a first connecting resistor (54) having a first end (54a) connected to the noninverting input (41b) of said fourth operational amplifier (41) and a second end (54b) connected to the inverting input (21a) of said second operational amplifier (21), said filter (1) being in addition preferably provided with a second connecting resistor (55) having a first end (55a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (55b) connected to a fixed-potential node, preferably a grounded node, the output (41c) of said fourth operational amplifier (41) being connected, preferably in a direct manner, to the noninverting input (31b) of said third operational amplifier (31).

81. A filter as claimed in anyone of claims 76 to 79, characterised in that it is further provided with a dividing resistor (56) having a first end (56a) connected to the noninverting input (41b) of said fourth operational amplifier (41) and a second end (56b) connected to a fixed-potential node, preferably a grounded node, and/or in that it is in addition provided with a secondary resistor (62) connected between the inverting input (21a) of said second operational amplifier (21) and a fixed-potential node, preferably a grounded node, and/or with an auxiliary resistor (61) connected between the inverting input

(31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node.

82. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· a first resistor (12) having a first end (12a) connected with the noninverting input (11b) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);
· a second resistor (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11);
- a second stage (20) provided with:
· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);
· feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21), said feedback means (23) being preferably defined by a single capacitor or a capacitor in series with a resistor;
· a resistor (22) having a first end (22a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);
- a third stage (30) provided with:
· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and

an output (31c);

· feedback means (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31), said feedback means (33) being preferably defined by a single capacitor or a capacitor in series with a resistor;

- a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a fourth stage (40) provided with:

- a fourth operational amplifier (41) having a noninverting input (41b) connected to the inverting input (11a) of said first operational amplifier (11) through a direct connection (218), an inverting input (41a) and an output (41c);

- a feedback resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41), either directly or through another resistor, and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

83. A filter as claimed in claim 82, characterised in that it further comprises a secondary resistor (62) having a first end (62a) connected to the inverting input (21a) of said second operational amplifier (21)

and a second end (62b) connected to a fixed-potential node, preferably a grounded node, and/or in that it also comprises a connecting resistor (42) having a first end (42a) connected to the first end (43a) of the feedback resistor (43) of said fourth stage (40) and a second end (42b) connected to a fixed-potential node, preferably a grounded node.

84. A filter as claimed in claim 82 or 83, characterised in that the output (41c) of said fourth operational amplifier (41) is connected, preferably in a direct manner, to the noninverting input (21b) of said second operational amplifier (21) and/or in that it further comprises a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31).

85. A filter as claimed in claim 82, 83 or 84, characterised in that it further comprises an auxiliary resistor (61) having a first end (61a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (61b) connected to a fixed-potential node, preferably a grounded node.

86. A filter as claimed in claim 82 or 83, characterised in that the output (41c) of said fourth operational amplifier (41) is connected, preferably in a direct manner, to the noninverting input (21b) of said second operational amplifier (21) and/or to the noninverting input (31b) of said third operational amplifier (31).

87. A filter as claimed in anyone of claims 82 to 86, characterised in that it further comprises a connecting

network (45) to connect said first, second and fourth stages (10, 20, 40) together, said connecting network (45) being provided with:

- a first resistor (46) having a first end (46a) connected to the output (21c) of said second operational amplifier (21) and a second end (46b) connected to the first end (43a) of the feedback resistor (43) of said fourth stage (40);

a second resistor (47) having a first end (47a) connected to the output (21c) of said second operational amplifier (21) and a second end (47b) connected to the noninverting input (11b) of said first operational amplifier (11);

- a third resistor (48) having a first end (48a) connected to the noninverting input (11b) of said first operational amplifier (11) and a second end (48b) connected to a fixed-potential node, preferably to a grounded node.

88. An active filter comprising:

- a first stage (10) provided with:

· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);

· a resistor (12) having a first end (11a) connected with the noninverting input (11b) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);

· feedback means (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11), said feedback means (13) being preferably defined by a single branch or a branch connected in parallel to a resistor, this branch

comprising a single capacitor or a capacitor in series with a resistor;;

- a second stage (20) provided with:

· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);

· a resistor (22) having a first end (22a) connected with the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);

· feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21), said feedback means (23) being preferably defined by a single capacitor or a capacitor in series with a resistor;

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· a second resistor (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31);

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting

input (11a) of said first operational amplifier (11), characterised in that it is further provided with a main resistor (60) connected between the inverting input (11a) of said first operational amplifier (11) and a fixed-potential node, preferably a grounded node, and/or with a secondary resistor (62) connected between the inverting input (21a) of said second operational amplifier (21) and a fixed-potential node, preferably a grounded node.

89. A filter as claimed in claim 88, characterised in that it further comprises a fourth stage (40) provided with:

- a fourth operational amplifier (41) having an inverting input (41a), a noninverting input (41b) and an output (41c);
- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to the output (11c) of said first operational amplifier (11);
- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

90. A filter as claimed in claim 89, characterised in that it further comprises a feedback resistor (44) connected between the output (41c) of said fourth operational amplifier (41) and the inverting input (11a) of said first operational amplifier (11), the feedback means (13) of said first stage (10) being preferably defined by a single capacitor or a capacitor in series with a resistor.

91. A filter as claimed in claim 89 or 90, characterised in that the noninverting input (41b) of said fourth operational amplifier (41) is directly connected to the inverting input (11a) of said first operational amplifier (11).

92. A filter as claimed in claim 89 or 90, characterised in that the noninverting input (41b) of said fourth operational amplifier (41) is directly connected to the inverting input (21a) of said second operational amplifier (21).

93. A filter as claimed in anyone of claims 88 to 91, characterised in that it further comprises a feedback branch (203), preferably defined by a direct connection or by amplifying means and having a first end (203a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (203b) connected to the noninverting input (31b) of said third operational amplifier (31), said amplifying means having an input connected to the first end (203a) of said feedback branch (203) and an output connected to the second end (203b) of the same branch (203), and/or in that it further comprises a direct connection (201) between the inverting input (31a) of said third operational amplifier (31) and the noninverting input (21b) of said second operational amplifier (21), the inverting input (21a) of said second operational amplifier (21) being connected to a fixed-potential node, preferably a grounded node, through said secondary resistor (62).

94. A filter as claimed in anyone of claims 88, 89, 90 and 92, characterised in that it further comprises a direct connection (207) between the inverting input

(31a) of said third operational amplifier (31) and the noninverting input (11b) of said first operational amplifier (11) and/or in that it further comprises a direct connection (204) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21).

95. A filter as claimed in anyone of claims 88, 89, 90 and 92, characterised in that it further comprises a direct connection (207) between the inverting input (31a) of said third operational amplifier (31) and the noninverting input (11b) of said first operational amplifier (11), and/or in that it also comprises a direct connection (201) between the inverting input (31a) of said third operational amplifier (31) and the noninverting input (21b) of said second operational amplifier (21), the inverting input (11a) of said first operational amplifier (11) being connected, through said main resistor (60), to a fixed-potential node, preferably a grounded node.

96. A filter as claimed in anyone of claims 88 to 91, characterised in that it is further provided with a direct connection (204) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21) and/or in that it is in addition provided with a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31), or with a direct connection (203) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (31b) of said third operational

amplifier (31), the inverting input (21a) of said second operational amplifier (21) being connected, through said secondary resistor (62), to a fixed-potential node, preferably a grounded node.

97. A filter as claimed in anyone of claims 88 to 96, characterised in that it further comprises a resistor, said filter (1) being also preferably provided with a feedback resistor (206) having a first end (206a) connected to the output (11c) of said first operational amplifier (11) and a second end (206b) connected to the inverting input (31a) of said third operational amplifier (31), the feedback means (13) of said first stage (10) being defined by a single capacitor or a capacitor in series with a resistor.

98. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· a resistor (12) having a first end (12a) connected with the noninverting input (11b) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);
· feedback means (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11), said feedback means (13) being preferably defined by a single capacitor or a capacitor in series with a resistor;
- a second stage (20) provided with:
· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and

an output (21c);

· a resistor (22) having a first end (22a) connected with the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);

· feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21), said feedback means (23) being preferably defined by a single capacitor or a capacitor in series with a resistor;

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a first resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· a second resistor (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31);

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a fourth stage (40) provided with:

- a fourth operational amplifier (41) having an

inverting input (41a), a noninverting input (41b) and an output (41c), said inverting input (41a) being directly connected either to the noninverting input (11b) of said first operational amplifier (11) or to the noninverting input (31b) of said third operational amplifier (31);

- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to the output (11c) of said first operational amplifier (11);

- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

99. A filter as claimed in claim 98, characterised in that the feedback means (13) of said first stage (10) is defined by a resistor connected in parallel to a branch comprising a single capacitor or a capacitor in series with a resistor, or in that it is also provided with a feedback resistor (44) connected between the output (41c) of said fourth operational amplifier (41) and the inverting input (11a) of said first operational amplifier (11), and/or with a feedback resistor (206) connected between the output (11c) of said first operational amplifier (11) and the inverting input (31a) of said third operational amplifier (31).

100. A filter as claimed in claim 98 or 99, characterised in that the inverting input (31a) of said third operational amplifier (31) is directly connected to the noninverting input (41b) of said fourth operational amplifier (41), and/or in that it is also

provided with a main resistor (60) connected between the inverting input (11a) of said first operational amplifier (11) and a fixed-potential node, preferably a grounded node, and/or with a direct connection (204) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21), the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (11b) of said first operational amplifier (11).

101. A filter as claimed in claim 98 or 99, characterised in that the inverting input (31a) of said third operational amplifier (31) is directly connected to the noninverting input (41b) of said fourth operational amplifier (41), and/or in that it is also provided with a main resistor (60) connected between the inverting input (11a) of said first operational amplifier (11) and a fixed-potential node, preferably a grounded node, and/or with a direct connection (201) between the inverting input (31a) of said third operational amplifier (31) and the noninverting input (21b) of said second operational amplifier (21), the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (11b) of said first operational amplifier (11).

102. A filter as claimed in claim 98 or 99, characterised in that it is further provided with an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node, or with a main resistor (60) connected between the

inverting input (11a) of said first operational amplifier (11) and a fixed-potential node, preferably a grounded node, and/or in that it is in addition provided with a direct connection (207) between the inverting input (31a) of said third operational amplifier (31) and the noninverting input (11b) of said first operational amplifier (11), and/or with a connection, preferably in a direct manner, between the noninverting input (41b) of said fourth operational amplifier (41) and a fixed-potential node, in particular a grounded node, or the inverting input (21a) of said second operational amplifier (21), the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (31b) of said third operational amplifier (31).

103. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· feedback means (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected to the output (11c) of said first operational amplifier (11), said feedback means (13) being preferably defined by a single capacitor or a capacitor in series with a resistor;
· a resistor (12) having a first end (12a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);
- a second stage (20) provided with:
· a second operational amplifier (21), having an

inverting input (21a), a noninverting input (21b) and an output (21c);

· feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21), said feedback means (23) being preferably defined by a single capacitor or a capacitor in series with a resistor;

· a resistor (22) having a first end (22a) connected with the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a first resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· a second resistor (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31);

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a fourth stage (40) provided with:

- a fourth operational amplifier (41) having an inverting input (41a), a noninverting input (41b) and an output (41c);
- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to the output (31c) of said third operational amplifier (31), the inverting input (41a) of said fourth operational amplifier (41) being directly connected with the noninverting input (21b) of said second operational amplifier (21) or with the noninverting input (31b) of said third operational amplifier (31);
- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

104. A filter as claimed in claim 103, characterised in that the feedback means (23) of said second stage (20) is preferably defined by a branch comprising a single capacitor or a capacitor in series with a resistor, this branch being connected in parallel to another branch comprising a single resistor or a resistor in series with a capacitor, and in that it further comprises a feedback resistor (206) having a first end (206a) connected to the output (11c) of said first operational amplifier (11) and a second end (206b) connected to the inverting input (31a) of said third operational amplifier (31) or to the inverting input (11a) of said first operational amplifier (11).

105. A filter as claimed in claim 103 or 104, characterised in that the noninverting input (41b) of

said fourth operational amplifier (41) is connected to a fixed-potential node, preferably a grounded node.

106. A filter as claimed in anyone of claims 103 to 105, characterised in that it further comprises a direct connection (204) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21), and/or in that it also comprises a secondary resistor (62) having a first end (62a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (62b) connected to a fixed-potential node, preferably a grounded node, the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (31b) of said third operational amplifier (31).

107. A filter as claimed in claim 103 or 104, characterised in that it further comprises a direct connection (218) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (41b) of said fourth operational amplifier (41), and/or in that it also comprises a secondary resistor (62) having a first end (62a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (62b) connected to a fixed-potential node, preferably a grounded node.

108. A filter as claimed in claim 103, 104 or 107, characterised in that it further comprises a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational

amplifier (31), and/or in that it also comprises an auxiliary resistor (61) having a first end (61a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (61b) connected to a fixed-potential node, preferably a grounded node, the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (21b) of said second operational amplifier (21).

109. A filter as claimed in claim 103, 104 or 107, characterised in that it further comprises a direct connection (201) between the noninverting input (21b) of said second operational amplifier (21) and the inverting input (31a) of said third operational amplifier (31), the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (31b) of said third operational amplifier (31).

110. A filter as claimed in claim 103 or 104, characterised in that it also comprises a direct connection (223) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (41b) of said fourth operational amplifier (41), and/or in that it further comprises an auxiliary resistor (61) having a first end (61a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (61b) connected to a fixed-potential node, preferably a grounded node, the inverting input (41a) of said fourth operational amplifier (41) being directly connected to the noninverting input (31b) of said third operational amplifier (31).

111. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· feedback means (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11), said feedback means (13) being preferably defined by a single capacitor or a capacitor in series with a resistor;
· a resistor (12) having a first end (12a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);
- a second stage (20) provided with:
· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);
· feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21), said feedback means (23) being preferably defined by a single capacitor or a capacitor in series with a resistor;
· a resistor (22) having a first end (22a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);
- a third stage (30) provided with:
· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a first resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· a second resistor (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31);

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a fourth stage (40) provided with:

- a fourth operational amplifier (41) having an inverting input (41a), a noninverting input (41b) and an output (41c), said noninverting input (41b) being directly connected to the inverting input (31a) of said third operational amplifier (31);

- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to a fixed-potential node, preferably a grounded node;

- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

112. A filter as claimed in claim 111, characterised in that the feedback means (23) of said second stage (20)

is preferably defined by a branch comprising a single capacitor or a capacitor in series with a resistor, this branch being connected in parallel to another branch comprising a single resistor or a resistor in series with a capacitor, or in that it also comprises a feedback resistor (206) having a first end (206a) connected to the output (11c) of said first operational amplifier (11) and a second end (206b) connected to the inverting input (31a) of said third operational amplifier (31) or to the inverting input (11a) of said first operational amplifier (11).

113. A filter as claimed in claim 111 or 112, characterised in that the output (41c) of said fourth operational amplifier (41) is connected, preferably in a direct manner, with the noninverting input (21b) of said second operational amplifier (21), and/or in that it is also provided with a direct connection (203) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (31b) of said third operational amplifier (31), and/or with a secondary resistor (62), having a first end (62a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (62b) connected to a fixed-potential node, preferably a grounded node.

114. A filter as claimed in claim 111 or 112, characterised in that it further comprises a main resistor (60) having a first end (60a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (60b) connected to a fixed-potential node, preferably a grounded node, and/or in that the output (41c) of said fourth operational amplifier (41) is connected, preferably in

a direct manner, to the noninverting input (11b) of said first operational amplifier (11), and/or to the noninverting input (21b) of said second operational amplifier (21).

115. A filter as claimed in claim 111 or 112, characterised in that it is further provided with a secondary resistor (62) connected between the inverting input (21a) of said second operational amplifier (21) and a fixed-potential node, preferably a grounded node, and/or with a main resistor (60) connected between the inverting input (11a) of said first operational amplifier (11) and a fixed-potential node, preferably a grounded node, and/or in that it is also provided with a direct connection (204) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21), and/or with a preferably direct connection between the output (41c) of said fourth operational amplifier (41) and the noninverting input (11b) of said first operational amplifier (11).

116. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· feedback means (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11), said feedback means (13) being preferably defined by a single capacitor or a capacitor in series with a resistor;
· a resistor (12) having a first end (12a) connected to

the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);

- a second stage (20) provided with:

· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);

· feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21), said feedback means (23) being preferably defined by a single capacitor or a capacitor in series with a resistor;

· a resistor (22) having a first end (22a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a first resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· a second resistor (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31);

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier

(31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11), characterised in that it further comprises a fourth stage (40) provided with:

- a fourth operational amplifier (41) having a noninverting input (41b), an inverting input (41a) and an output (41c), said noninverting input (41b) being directly connected to the inverting input (31a) of said third operational amplifier (31) or to the inverting input (11a) of said first operational amplifier (11);
- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to the output (21c) of said second operational amplifier (21);
- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

117. A filter as claimed in claim 116, characterised in that it is further provided with a direct connection (83) between the inverting input (41a) of said fourth operational amplifier (41) and the noninverting input (11b) of said first operational amplifier (11) and with a direct connection (204) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21) or in that it is further provided with a direct connection (86) between the inverting input (41a) of said fourth operational amplifier (41) and the noninverting input (21b) of said second operational amplifier (21), said filter (1) being also preferably provided with a main resistor (60) connected between

the inverting input (11a) of said first operational amplifier (11) and a fixed-potential node, and/or with a secondary resistor (62) connected between the inverting input (21a) of said second operational amplifier (21) and a fixed-potential node, preferably a grounded node, said filter (1) most preferably being also provided with a feedback resistor (206) having a first end (206a) connected to the output (11c) of said first operational amplifier (11) and a second end (206b) connected to the inverting input (31a) of said third operational amplifier (31) or the inverting input (11a) of said first operational amplifier (11).

118. An active filter comprising:

- a first stage (10) provided with:
  - a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
  - feedback means (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11), said feedback means (13) preferably comprising a single capacitor or a capacitor in series with a resistor;
  - a resistor (12) having a first end (12a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);
- a second stage (20) provided with:
  - a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);
  - feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second

operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21), said feedback means (23) preferably comprising a single capacitor or a capacitor in series with a resistor;

· a resistor (22) having a first end (22a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· a second resistor (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31);

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises an auxiliary network (95) provided with:

- a first resistor (96) having a first end (96a) connected to the output (11c) of said first operational amplifier (11) and a second end (96b) connected to the noninverting input (31b) of said third operational amplifier (31);

- a second resistor (97) having a first end (97a)

connected to the noninverting input (31b) of said third operational amplifier (31) and a second end (97b), the second end (97b) of said second resistor (97) being directly connected to the inverting input (21a) of said second operational amplifier (21) or to a fixed-potential node, preferably a grounded node.

119. A filter as claimed in claim 118, characterised in that it further comprises a direct connection (204) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21), said filter (1) being further preferably provided with a secondary resistor (62) having a first end (62a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (62b) connected to a fixed-potential node, preferably a grounded node.

120. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· feedback means (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11), said feedback means (13) preferably comprising a single capacitor or a capacitor in series with a resistor;
· a resistor (12) having a first end (12a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);

- a second stage (20) provided with:
· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);
- a first resistor (22) having a first end (22a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);
· a second resistor (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b);
- a third stage (30) provided with:
· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);
· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b);
· feedback means (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31), said feedback means (33) being preferably defined by a single capacitor or a capacitor in series with a resistor;
- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),
characterised in that it further comprises a fourth stage (40) interposed in circuit between said second and third stages (20, 30), said fourth stage (40) being provided with:

- a fourth operational amplifier (41) having a noninverting input (41b), preferably directly connected to the output (21c) of said second operational amplifier (21), an inverting input (41a), and an output (41c), the latter being connected to the second end (32b) of the resistor (32) of said third stage (30) and to the second end (23b) of the second resistor (23) of said second stage (20);
- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to the output (11c) of said first operational amplifier (11);
- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

121. A filter as claimed in claim 120, characterised in that the feedback means (33) of said third stage (30) is preferably defined by a branch comprising a single capacitor or a capacitor in series with a resistor, this branch being connected in parallel to another branch comprising a single resistor or a resistor in series with a capacitor, or in that it further comprises a feedback resistor (114) having a first end (114a) connected to the output (41c) of said fourth operational amplifier (41) or to the output (11c) of said first operational amplifier (11), and a second end (114b) connected to the inverting input (11a) of said first operational amplifier (11).

122. A filter as claimed in claim 120 or 121, characterised in that it further comprises a direct

connection (204) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21), and/or in that it further comprises a secondary resistor (62) having a first end (62a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (62b) connected to a fixed-potential node, preferably a grounded node.

123. A filter as claimed in claim 120 or 121, characterised in that it is further provided with a secondary resistor (62) having a first end (62a) connected to the inverting input (21a) of said second operational amplifier (21), and a second end (62b) connected to a fixed-potential node, preferably a grounded node, and/or in that it is also provided with a direct connection (201) between the noninverting input (21b) of said second operational amplifier (21) and the inverting input (31a) of said third operational amplifier (31), and/or with a direct connection (203) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (31b) of said third operational amplifier (31).

124. A filter as claimed in claim 120 or 121, characterised in that it further comprises a direct connection (207) between the noninverting input (11b) of said first operational amplifier (11) and the inverting input (31a) of said third operational amplifier (31), and/or in that it further comprises a main resistor (60) having a first end (60a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (60b) connected to a fixed-potential node, preferably a grounded node.

125. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· feedback means (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11), said feedback means (13) being preferably defined by a single capacitor or a capacitor in series with a resistor;
· a resistor (12) having a first end (12a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);
- a second stage (20) provided with:
· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);
· feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21), said feedback means (23) being preferably defined by a single capacitor or a capacitor in series with a resistor;
· a resistor (22) having a first end (22a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);
- a third stage (30) provided with:
· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a first resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· a second resistor (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b);

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a fourth stage (40) connected downstream of said third stage (30) and provided with:

- a fourth operational amplifier (41) having an inverting input (41a), a noninverting input (41b) preferably connected in a direct manner with the output (31c) of said third operational amplifier (31), and an output (41c), the latter being connected to the first end (50a) of said main feedback branch (50) and to the second end (33b) of the second resistor (33) of said third stage (30);

- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to the output (21c) of said second operational amplifier (21);

- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

126. A filter as claimed in claim 125, characterised in

that it further comprises a feedback resistor (115) having a first end (115a) connected to the inverting input (31a) of said third operational amplifier (31), or to the inverting input (11a) of said first operational amplifier (11), and a second end (115b) connected to the output (11c) of said first operational amplifier (11).

127. A filter as claimed in claim 125 or 126, characterised in that it further comprises an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node, and/or in that it also comprises a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31).

128. A filter as claimed in claim 125 or 126, characterised in that it is further provided with a direct connection (107) between the noninverting input (11b) of said first operational amplifier (11) and the inverting input (21a) of said second operational amplifier (21), and/or in that it is also provided with an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node, and/or with a direct connection (203) between the inverting input (11a) of said third operational amplifier (11) and the noninverting input (31b) of said third operational amplifier (31).

129. A filter as claimed in claim 125 or 126, characterised in that it further comprises a secondary resistor (62) connected between the inverting input

(21a) of said second operational amplifier (21) and a fixed-potential node, preferably a grounded node, and/or in that it further comprises a direct connection (204) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21).

130. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· a first resistor (12) having a first end (12a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);
· a second resistor (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b);
- a second stage (20) provided with:
· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);
· feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21), said feedback means (23) being preferably defined by a single capacitor or a capacitor in series with a resistor;
· a resistor (22) having a first end (22a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (22b);
- a third stage (30) provided with:
· a third operational amplifier (31) having an

inverting input (31a), a noninverting input (31b) and an output (31c);

· feedback means (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31), said feedback means (33) preferably comprising a single capacitor or a capacitor in series with a resistor;

· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a fourth stage (40) interposed between said first and second stages (10, 20) and provided with:

- a fourth operational amplifier (41) having a noninverting input (41b) connected, preferably in a direct manner, to the output (11c) of said first operational amplifier (11), an inverting input (41a) and an output (41c), the latter being connected to the second end (22b) of the resistor (22) of said second stage (20) and to the second end (13b) of the second resistor (13) of said first stage (10);

- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to the output (21c) of said second operational amplifier (21);

- a second resistor (43) having a first end (43a)

connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

131. A filter as claimed in claim 130, characterised in that the feedback means (23) of said second stage (20) or the feedback means (33) of said third stage (30) is defined by a branch comprising a capacitor and a resistor connected in series with each other, this branch being connected in parallel to a capacitor or to another branch of the same circuit type as the preceding one.

132. A filter as claimed in claim 130, characterised in that it further comprises a feedback resistor (116) having a first end (116a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (116b) connected to the output (41c) of said fourth operational amplifier (41), and/or in that it also comprises a feedback resistor (117) having a first end (117a) connected to the output (21c) of said second operational amplifier (21) and a second end (117) connected to the inverting input (11a) of said first operational amplifier (11).

133. A filter as claimed in claim 130, characterised in that it further comprises a feedback resistor (120) having a first end (120a) connected to the output (21c) of said second operational amplifier (21) and a second end (120b) connected to the noninverting input (11b) of said first operational amplifier (11).

134. A filter as claimed in anyone of claims 130 to 133, characterised in that it further comprises a main

resistor (60) connected between the inverting input (11a) of said first operational amplifier (11) and a fixed-potential node, preferably a grounded node, and/or in that it further comprises a connecting branch (118) having a first end (118a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (118b) connected to the noninverting input (11b) of said first operational amplifier (11), said connecting branch (118) being preferably defined by a resistor (119) or a direct connection (207).

135. A filter as claimed in claim 130, characterised in that the feedback means (23) of said second stage (20) is defined by a resistor parallel-connected to a branch comprising a single capacitor or a capacitor in series with a resistor, said filter (1) being further preferably provided with a feedback resistor (121) having a first end (121a) connected to the output (31c) of said third operational amplifier (31) and a second end (121b) connected to the inverting input (21a) of said second operational amplifier (21).

136. A filter as claimed in anyone of claims 130, 131, 132 and 135, characterised in that it is also provided with a direct connection (107) between the noninverting input (11b) of said first operational amplifier (11) and the inverting input (21a) of said second operational amplifier (21), and/or in that it is further provided with a main resistor (60) connected between the inverting input (11a) of said first operational amplifier (11) and a fixed-potential node, preferably a grounded node, and/or with a direct connection (201) between the noninverting input (21b) of said second operational amplifier (21) and the

inverting input (31a) of said third operational amplifier (31).

137. A filter as claimed in anyone of claims 130 to 133, characterised in that it is further provided with a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31), and/or in that it is also provided with an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node, and/or with a connecting branch (123) preferably defined by a resistor (124) or by a short circuit, and having a first end (123a) connected to the noninverting input (11b) of said first operational amplifier (11) and a second end (123b) connected to a fixed-potential node, preferably a grounded node.

138. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· a resistor (12) having a first end (12a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);
· feedback means (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11), said feedback means (13) being preferably defined by a single capacitor or a capacitor in series with a resistor;

- a second stage (20) provided with:
  · a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);
  · a first resistor (22) having a first end (22a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);
  · a second resistor (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21);
- a third stage (30) provided with:
  · a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);
  · feedback means (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31), said feedback means (33) being preferably defined by a single capacitor or a capacitor in series with a resistor;
  · a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);
- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a fourth

stage (40) provided with:
- a fourth operational amplifier (41) having a noninverting input (41b) directly connected to the inverting input (31a) of said third operational amplifier (31), an inverting input (41a) and an output (41c);
- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to a fixed-potential node, preferably a grounded node;
- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

139. A filter as claimed in claim 138, characterised in that the feedback means (33) of said third stage (30) is preferably defined by a branch comprising a single capacitor or a capacitor in series with a resistor, this branch being parallel-connected to another branch comprising a single resistor or a resistor in series with a capacitor or in that it also comprises a feedback resistor (74) having a first end (74a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (74b) connected to the output (11c) of said first operational amplifier (11) or to the output (21c) of said second operational amplifier (21).

140. A filter as claimed in claim 138 or 139, characterised in that it is further provided with a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the

noninverting input (31b) of said third operational amplifier (31), and/or with a preferably direct connection between the output (41c) of said fourth operational amplifier (41) and the noninverting input (11b) of said first operational amplifier (11), and/or in that it is also provided with a main resistor (60) having a first end (60a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (60b) connected to a fixed-potential node, preferably a grounded node, and/or with an auxiliary resistor (61) having a first end (61a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (61b) connected to a fixed-potential node, preferably a grounded node.

141. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· a resistor (12) having a first end (12a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);
· feedback means (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11), said feedback means (13) being preferably defined by a single capacitor or a capacitor in series with a resistor;
- a second stage (20) provided with:
· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and

an output (21c);

· feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21), said feedback means (23) being preferably defined by a single capacitor or a capacitor in series with a resistor;

· a resistor (22) having a first end (22a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a first resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· a second resistor (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31);

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a fourth stage (40) provided with:

- a fourth operational amplifier (41) having a noninverting input (41b) directly connected to the

inverting input (11a) of said first operational amplifier (11), an inverting input (41a) and an output (41c);

- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to a fixed-potential node, preferably a grounded node;

- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41).

142. A filter as claimed in claim 141, characterised in that it further comprises a connecting branch (215), preferably defined by a short circuit, between the output (41c) of said fourth operational amplifier (41) and the noninverting input (21b) of said second operational amplifier (21), and/or in that it further comprises a feedback resistor (102) having a first end (102a) connected to the inverting input (11a) of said first operational amplifier (11) or to the inverting input (31a) of said third operational amplifier (31), and a second end (102b) connected to the output (11c) of said first operational amplifier (11).

143. A filter as claimed in claim 141 or 142, characterised in that it is further provided with a direct connection (207) between the noninverting input (11b) of said first operational amplifier (11) and the inverting input (31a) of said third operational amplifier (31), and/or in that it is also provided with a main resistor (60) connected between the inverting input (11a) of said first operational amplifier (11)

and a fixed-potential node, preferably a grounded node, and/or with a secondary resistor (62) connected between the inverting input (21a) of said second operational amplifier (21) and a fixed-potential node, preferably a grounded node.

144. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· a first resistor (12) having a first end (12a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);
· a second resistor (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected with the output (11c) of said first operational amplifier (11);
- a second stage (20) provided with:
· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);
· feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b) connected to the output (21c) of said second operational amplifier (21), said feedback means (23) preferably comprising a single capacitor or a capacitor in series with a resistor;
· a resistor (22) having a first end (22a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· feedback means (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31), said feedback means (33) being preferably defined by a single capacitor or a capacitor in series with a resistor;

· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a fourth stage (40) provided with:

- a fourth operational amplifier (41) having a noninverting input (41b) directly connected to the inverting input (21a) of said second operational amplifier (21), an inverting input (41a) and an output (41c);

- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to a fixed-potential node, preferably a grounded node;

- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b)

connected to the output (41c) of said fourth operational amplifier (41).

145. A filter as claimed in claim 144, characterised in that the feedback means (23) of said second stage (20) or the feedback means (33) of said third stage (30) is defined by a branch comprising a resistor and a capacitor in series with each other, this branch being parallel-connected to a capacitor or to another branch of the same circuit type as the above one.

146. A filter as claimed in claim 144, characterised in that it further comprises a feedback resistor (104) connected between the output (21c) of said second operational amplifier (21) and the inverting input (11a) of said first operational amplifier (11), and/or in that it also comprises a feedback resistor (102) having a first end (102a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (102b) connected to the output (11c) of said first operational amplifier (11).

147. A filter as claimed in claim 144, characterised in that the feedback means (23) of said second stage (20) is defined by a resistor connected in parallel to a branch comprising a single capacitor or a capacitor in series with a resistor, said filter (1) being further preferably provided with a feedback resistor (109) connected between the output (31c) of said third operational amplifier (31) and the inverting input (21a) of said second operational amplifier (21).

148. A filter as claimed in anyone of claims 144 to 147, characterised in that it is further provided with an auxiliary resistor (61) connected between the

inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node, and/or with a secondary resistor (62) connected between the inverting input (21a) of said second operational amplifier (21) and a fixed-potential node, preferably a grounded node, and/or in that it is also provided with a direct connection (204) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21), and/or with a connecting branch (216), preferably defined by a short circuit, between the output (41c) of said fourth operational amplifier (41) and the noninverting input (31b) of said third operational amplifier (31).

149. An active filter comprising:

- a first stage (10) provided with:

· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);

· a resistor (12) having a first end (12a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs);

· a first connecting block (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b);

· a first connecting branch (15) having a first end (15a) connected to the second end (13b) of said first connecting block (13) and a second end (15b) connected to the output (11c) of said first operational amplifier (11);

- a second stage (20) provided with:

· a second operational amplifier (21), having an

inverting input (21a), a noninverting input (21b) and an output (21c);

· a resistor (22) having a first end (22a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);

· a second connecting block (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b);

· a second connecting branch (25) having a first end (25a) connected to the second end (23b) of said second connecting block (23) and a second end (25b) connected to the output (21c) of said second operational amplifier (21);

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· a third connecting block (33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b);

· a third connecting branch (35) having a first end (35a) connected to the second end (33b) of said third connecting block (33) and a second end (35b) connected to the output (31c) of said third operational amplifier (31);

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier

(31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11), characterised in that at least a predetermined one of said first, second and third connecting branches (15, 25, 35) comprises a fourth stage (40) provided with:
- a fourth operational amplifier (41) having an inverting input (41a), a noninverting input (41b) and an output (41c), the latter being connected to the first end (15a, 25a, or 35a) of said predetermined connecting branch (15, 25 or 35), the noninverting input (41b) of said fourth operational amplifier (41) being connected to the second end (15b, 25b, or 35b) of said predetermined connecting branch (15, 25 or 35), either directly or through a first resistor (42);
- a feedback branch (91) connected between the output (41c) and the inverting input (41a) of said fourth operational amplifier (41), said feedback branch (91) being preferably defined by a short circuit or a resistor (44).

150. A filter as claimed in claim 149, characterised in that said fourth stage (40) further comprises a second resistor (43) connected between the noninverting input (41b) and the output (41c) of said fourth operational amplifier (41) or between the inverting input (41a) of said fourth operational amplifier (41) and the second end (15b, 25b or 35b) of said predetermined connecting branch (15, 25 or 35).

151. A filter as claimed in claim 149 or 150, characterised in that the connecting branches among said first, second and third connecting branches (15, 25, 35) different from said predetermined connecting branch (15, 25, 35) are defined by a short circuit.

152. A filter as claimed in claim 149 or 150,

characterised in that each of two predetermined connecting branches of said first, second and third connecting branches (15, 25, 35) comprises a fourth stage provided with:

- a fourth operational amplifier (40) having an inverting input (41a), a noninverting input (41b), and an output (41c), the latter being connected to the first end (15a, 25a or 35a) of the respective predetermined connecting branch (15, 25 or 35), the noninverting input (41b) of said fourth operational amplifier (41) being connected to the second end (15b, 25b, 35b) of the respective predetermined connecting branch (15, 25 or 35), either directly or through a first resistor (42);
- a feedback branch (91) connected between the output (41c) and the inverting input (41a) of said fourth operational amplifier (41), said feedback branch (91) being defined by a short circuit or a resistor (44), said connecting branch of said first, second and third connecting branches (15, 25, 35) different from said predetermined connecting branches being defined by a short circuit.

153. A filter as claimed in claim 149, 150 or 151, characterised in that said first and third connecting branches (15, 35) are defined by a short circuit, the second connecting branch (25) comprising said fourth stage (40), the noninverting input (41b) of said fourth operational amplifier (41) being connected, either directly or through said first resistor (42), to the second end (25b) of said second connecting branch (25), the output (41c) of said fourth operational amplifier (41) being connected to the first end (25a) of the second connecting branch (25).

154. A filter as claimed in anyone of claims 149 to 153, characterised in that said first connecting block (13) is defined by a single capacitor or a capacitor in series with a resistor, said second connecting block (23) being in particular defined by a resistor (92).

155. A filter as claimed in claim 154, characterised in that said third connecting block (33) is defined by a single capacitor or a capacitor in series with a resistor, said filter (1) being in addition preferably provided with a feedback resistor (74) having a first end (74a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (74b) connected to the first end (15a) of said first connecting branch (15) or to the second end (25b) of said second connecting branch (25).

156. A filter as claimed in claim 154, characterised in that said third connecting block (33) is defined by a branch comprising a single capacitor or a capacitor in series with a resistor, this branch being connected in parallel to another branch comprising a single resistor or a resistor in series with a capacitor.

157. A filter as claimed in anyone of claims 149 to 156, characterised in that it further comprises a direct connection (207) between the noninverting input (11b) of said first operational amplifier (11) and the inverting input (31a) of said third operational amplifier (31), and/or in that it also comprises a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31).

158. A filter as claimed in anyone of claims 149 to 156, characterised in that it further comprises a direct connection (201) between the noninverting input (21b) of said second operational amplifier (21) and the inverting input (31a) of said third operational amplifier (31), and/or in that it also comprises a direct connection (107) between the noninverting input (11b) of said first operational amplifier (11) and the inverting input (21a) of said second operational amplifier (21).

159. A filter as claimed in anyone of claims 149 to 156, characterised in that it further comprises a direct connection (107) between the noninverting input (11b) of said first operational amplifier (11) and the inverting input (21a) of said second operational amplifier (21), and/or in that it also comprises a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31).

160 A filter as claimed in anyone of claims 149 to 159, characterised in that it further comprises a main resistor (60) connected between the inverting input (11a) of said first operational amplifier (11) and a fixed-potential node, preferably a grounded node, and/or in that it also comprises an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node.

161. A filter as claimed in claim 149, 150 or 151, characterised in that said first and second connecting branches (15, 25) are defined by a short circuit, said

third connecting branch (35) comprising the fourth stage (40), the noninverting input (41b) of said fourth operational amplifier (41) being connected, either directly or through said fist resistor (42), to the second end (35b) of said third connecting branch (35), the output (41c) of said fourth operational amplifier (41) being connected to the first end (35a) of said third connecting branch (35).

162. A filter as claimed in anyone of claims 149 to 152, or as claimed in claim 161, characterised in that said first connecting block (13) is defined by a single capacitor or a capacitor in series with a resistor, said filter (1) being further preferably provided with a feedback resistor (102) having a first end (102a) connected to the inverting input (31a) of said third operational amplifier (31), and a second end (102b) connected to the output (11c) of said first operational amplifier (11), or in that said first connecting block (13) is defined by a resistor parallel-connected to a branch comprising a single capacitor or a capacitor in series with a resistor, said second and third connecting blocks (23, 33) being defined by a single capacitor or a capacitor in series with a resistor or by a resistor (92), respectively.

163. A filter as claimed in anyone of claims 149 to 152, or as claimed in either of claims 161 or 162 characterised in that it also comprises a direct connection (204) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21), and/or in that it further comprises a direct connection (207) between the noninverting input (11b) of said first operational amplifier (11) and the

inverting input (31a) of said third operational amplifier (31).

164. A filter as claimed in anyone of claims 149 to 152, or as claimed in either of claims 161 or 162, characterised in that it also comprises a direct connection (203) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (31b) of said third operational amplifier (31), and/or in that it also comprises a direct connection (201) between the inverting input (31a) of said third operational amplifier (31) and the noninverting input (21b) of said second operational amplifier (21).

165. A filter as claimed in anyone of claims 149 to 152, or as claimed in either of claims 161 or 162, characterised in that it also comprises a direct connection (207) between the noninverting input (11b) of said first operational amplifier (11) and the inverting input (31a) of said third operational amplifier (31), and/or in that it further comprises a direct connection (201) between the noninverting input (21b) of said second operational amplifier (21) and the inverting input (31a) of said third operational amplifier (31).

166. A filter as claimed in anyone of claims 149 to 152, or claims 161 to 165, characterised in that it also comprises a main resistor (60) connected between the inverting input (11a) of said first operational amplifier (11) and a fixed-potential node, preferably a grounded node, and/or in that it further comprises a secondary resistor (62) connected between the inverting input (21a) of said second operational amplifier (21)

and a fixed-potential node, preferably a grounded node.

167. A filter as claimed in claim 149, 150 or 151, characterised in that said second and third connecting branches (25, 35) are preferably defined by a short circuit, said first connecting branch (15) comprising the fourth stage (40), the noninverting input (41b) of said fourth operational amplifier (41) being connected, either directly or through said first resistor (42), to the second end (15b) of said first connecting branch (15), the output (41c) of said fourth operational amplifier (41) being connected to the first end (15a) of said first connecting branch (15).

168. A filter as claimed in anyone of claims 149 to 152, or as claimed in claim 167, characterised in that said first connecting block (13) is defined by a resistor (92).

169. A filter as claimed in claim 168, characterised in that said second connecting block (23) is defined by a branch comprising a capacitor and a resistor in series with each other, this branch being connected in parallel to a capacitor or to another branch of the same circuit type as the preceding one, said third connecting block (33) being preferably defined by a single capacitor or a capacitor in series with a resistor, or in that said second connecting block (23) is defined by a single capacitor or a capacitor in series with a resistor, and in that said third connecting block (33) is defined by a branch comprising a capacitor and a resistor in series with each other, this branch being connected in parallel to a capacitor or to another branch of the same circuit type as the preceding one.

170. A filter as claimed in claim 168, characterised in that said second connecting block (23) is defined by a resistor, connected in parallel to a branch comprising a single capacitor or a capacitor in series with a resistor and in that said third connecting block (33) is defined by a single capacitor or a capacitor in series with a resistor, said filter (1) being further preferably provided with a feedback resistor (109) connected between the output (31c) of said third operational amplifier (31) and the inverting input (21a) of said second operational amplifier (21).

171. A filter as claimed in claim 168, characterised in that said second and third connecting blocks (23, 33) are defined by a single capacitor or a capacitor in series with a resistor, said filter (1) being further preferably provided with a feedback resistor (29) having a first end (29a) connected to the output (21c) of said second operational amplifier (21) and a second end (29b) connected to the inverting input (11a) of said first operational amplifier (11), and/or with a feedback resistor (102) having a first end (102a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (102b) connected to the output (11c) of said first operational amplifier (11).

172. A filter as claimed in anyone of claims 149 to 152, or in claims 167 to 171, characterised in that it further comprises a direct connection (212) between the inverting input (21a) of said second operational amplifier (21) and the noninverting input (31b) of said third operational amplifier (31), and/or in that it further comprises a direct connection (204) between the inverting input (11a) of said first operational

amplifier (11) and the noninverting input (21b) of said second operational amplifier (21).

173. A filter as claimed in anyone of claims 149 to 152, or claims 167 to 171, characterised in that it further comprises a direct connection (203) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (31b) of said third operational amplifier (31), and/or in that it also comprises a direct connection (107) between the noninverting input (11b) of said first operational amplifier (11) and the inverting input (21a) of said second operational amplifier (21).

174. A filter as claimed in anyone of claims 149 to 152, or claims 167 to 171, characterised in that it further comprises a direct connection (204) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (21b) of said second operational amplifier (21), and/or in that it also comprises a direct connection (203) between the inverting input (11a) of said first operational amplifier (11) and the noninverting input (31b) of said third operational amplifier (31).

175. A filter as claimed in anyone of claims 149 to 152 and claims 167 to 174, characterised in that it further comprises an auxiliary resistor (61) connected between the inverting input (31a) of said third operational amplifier (31) and a fixed-potential node, preferably a grounded node, and/or in that it also comprises a secondary resistor (62) connected between the inverting input (21a) of said second operational amplifier (21) and a fixed-potential node, preferably a grounded node.

176. An amplifying stage comprising:
- a first stage (400) provided with:
· a first operational amplifier (401) having an inverting input (401a), a noninverting input (401b) and an output (401c);
· a first resistor (402) having a first end (402a) connected to the inverting input (401a) of said first operational amplifier (401) and a second end (402b) set to receive an input signal (Vs);
· a second resistor (403) having a first end (403a) connected to the inverting input (401a) of said first operational amplifier (401) and a second end (403b) connected with the output (401c) of said first operational amplifier (401);
- a second stage (500) provided with:
· a second operational amplifier (501), having an inverting input (501a), a noninverting input (501b) and an output (501c);
· a first resistor (502) having a first end (502a) connected to the inverting input (501a) of said second operational amplifier (501) and a second end (502b) connected to the output (401c) of said first operational amplifier (401);
· a second resistor (503) having a first end (503a) connected to the inverting input (501a) of said second operational amplifier (501) and a second end (503b) connected to the output (501c) of said second operational amplifier (501);
characterised in that it further comprises a direct connection (399) between the noninverting input (401b) of said first operational amplifier (401) and the inverting input (501a) of said second operational amplifier (501), the noninverting input (501b) of said second operational amplifier (501) being preferably connected to a fixed-potential node, and in particular

a grounded node.

177. An active stage characterised in that it comprises:

- a first operational amplifier (401) having an inverting input (401a), a noninverting input (401b) and an output (401c);
- a resistor (402) having a first end (402a) connected to the inverting input (401a) of said first operational amplifier (401) and a second end (402b) set to receive an input signal (Vs);
- a second operational amplifier (510) having an inverting input (501a), a noninverting input (501b) and an output (501c);
- a connecting branch (396) between the output (401c) of said first operational amplifier (401) and the noninverting input (501b) of said second operational amplifier (501), said connecting branch (396) being defined by a first resistor (502) or by a direct connection;
- a feedback branch (395) between the inverting input (501a) and the output (501c) of said second operational amplifier (501), said feedback branch (395) being preferably defined by a second resistor (503) or a direct connection;
- a connecting block (450) interposed in circuit between the output (501c) of said second operational amplifier (501) and the inverting input (401a) of said first operational amplifier (401).

178. A stage as claimed in claim 177, characterised in that it further comprises a connecting resistor (504) between the output (501c) and the noninverting input (501b) of said second operational amplifier (501), or between the output (401c) of said first operational

amplifier (401) and the inverting input (501a) of said second operational amplifier (501).

179. A stage as claimed in claim 177 or 178, characterised in that said connecting block (450) is defined by a resistor and/or a capacitor, or by a branch comprising a resistor and a capacitor in series with each other, this branch being connected in parallel to a resistor or to a capacitor, or to another branch of the same circuit type as the preceding one.

180. An active filter comprising:
- a first stage (10) provided with:
· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);
· feedback means (13) having a first end (13a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (13b) connected to the output (11c) of said first operational amplifier (11), said feedback means (13) being preferably defined by a resistor or a branch comprising either a single capacitor or a capacitor in series with a resistor;
- a second stage (20) provided with:
· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);
· a resistor (22) having a first end (22a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);
· feedback means (23) having a first end (23a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (23b)

connected to the output (21c) of said second operational amplifier (21), said feedback means (23) being preferably defined either by a capacitor or a resistor, or by a capacitor and a resistor in series with each other;

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· feedback means(33) having a first end (33a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (33b) connected to the output (31c) of said third operational amplifier (31), said feedback means (33) being preferably defined by a capacitor and/or by a resistor;

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting input (11a) of said first operational amplifier (11),

characterised in that it further comprises a first connecting branch having a first end connected to the inverting input (11a, 21a or 31a) of a predetermined one of said first, second and third operational amplifiers (11, 21, 31) and a second end connected to at least one of the two noninverting inputs of the respective ones of said operational amplifiers (11, 21, 31) different from said predetermined operational amplifier (11, 21, 31), at least the noninverting input (11b, 21b or 31b) of the latter being connected, either directly or through a resistor, to a fixed-potential

node, preferably a grounded node, said first connecting branch being also preferably defined by a direct connection or by a respective fourth stage (40) provided with an amplifier and having an input ("in") connected to the first end of said first connecting branch, and an output ("out") connected to the second end of the same branch either directly or through a respective resistor.

181. A filter as claimed in claim 180, characterised in that it further comprises a main resistor (60) having a first end (60a) connected to the inverting input (11a) of said first operational amplifier (11) different from said predetermined operational amplifier (21 or 31), and a second end (60b) connected to a fixed-potential node, preferably a grounded node.

182. A filter as claimed in claim 180 or 181, characterised in that it further comprises an auxiliary resistor (61) having a first end (61a) connected to the inverting input (31a) of said third operational amplifier (31) different from said predetermined operational amplifier (11 or 21), and a second end (61b) connected to a fixed-potential node, preferably a grounded node.

183. A filter as claimed in claim 180, 181 or 182 (when depending on claim 180), characterised in that it further comprises a secondary resistor (62) having a first end (62a) connected to the inverting input (21a) of said second operational amplifier (21) different from said predetermined operational amplifier (11 or 31) and a second end (62b) connected to a fixed-potential node, preferably a grounded node.

184. A filter as claimed in anyone of claims 180 to 183, characterised in that it further comprises a second connecting branch having a first end connected to the inverting input (11a, 21a or 31a) of one of said first, second and third operational amplifiers (11, 21, 31) and a second end connected to the noninverting input (11b, 21b or 31b) of another of the same operational amplifiers (11, 21, 31) different from said predetermined operational amplifier (11, 21 or 31), the second end of said first connecting branch being connected to one alone of the two noninverting inputs of the respective ones of said operational amplifiers (11, 21, 31) different from said predetermined operational amplifier.

185. A filter as claimed in claim 184, characterised in that said second connecting branch is preferably defined by a direct connection or by a respective fourth stage (40) provided with an amplifier and having an input ("in") connected to the first end of said second connecting branch, and an output ("out") connected to the second end of the same branch either directly or through a respective resistor.

186. A filter as claimed in claim 184, characterised in that said second connecting branch is preferably defined by a respective fourth stage (40) provided with an amplifier and having an input ("in") connected to the first end of said second connecting branch and an output ("out") connected to the second end of the same branch, through a respective resistor, the first end of said second connecting branch being connected to the inverting input of one of said first, second and third operational amplifiers (11, 21, 31) different from said predetermined operational amplifier, the first

connecting branch being further defined by said respective fourth stage (40), the output ("out") of the latter being more particularly connected to the second end of said first connecting branch through said respective resistor, the second end of said first connecting branch and the second end of said second connecting branch being also and still more particularly connected to the same noninverting input.

187. A filter as claimed in anyone of claims 180 to 186, characterised in that it also comprises a resistor (12) having a first end (12a) preferably connected to the inverting input (11a) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs).

188. A filter as claimed in anyone of claims 180 to 183, characterised in that it further comprises a resistor (12) having a first end (12a) preferably connected to the noninverting input (11b) of said first operational amplifier (11) and a second end (12b) set to receive an input signal (Vs).

189. A filter as claimed in anyone of claims 180 to 188, characterised in that it further comprises a feedback resistor (206) having a first end (206a) connected to the output (11c) of said first operational amplifier (11) and a second end (206b) connected to the inverting input (11a) of said first operational amplifier (11), or to the inverting input (31a) of said third operational amplifier (31), and/or in that it further comprises a feedback branch (103) preferably defined by a feedback resistor (104) and having a first end (103a) connected to the output (21c) of said second operational amplifier (21) and a second end (103b)

connected to the inverting input (11a) of said first operational amplifier (11).

190. A filter as claimed in anyone of claims 180 to 188, characterised in that the feedback means (23) of said second stage (20) is preferably defined by a resistor connected in parallel to a branch comprising a single capacitor or a capacitor in series with a resistor, and/or in that it further comprises a feedback branch (108) preferably defined by a feedback resistor (109) and having a first end (108a) connected to the output (31c) of said third operational amplifier (31) and a second end (108b) connected to the inverting input (21a) of said second operational amplifier (21).

191. A filter as claimed in anyone of claims 180 to 188, characterised in that the feedback means (33) of said third stage (30) is preferably defined by a resistor connected in parallel to a branch comprising a capacitor and a resistor in series with each other, or in that the feedback means (23) of said second stage (20), or the feedback means (33) of said third stage (30) is preferably defined by a branch comprising a capacitor and a resistor in series with each other, this branch being connected in parallel to a capacitor or to another branch of the same circuit type as the preceding branch.

192. An active filter comprising:

- a first stage (10) provided with:

· a first operational amplifier (11) having an inverting input (11a), a noninverting input (11b) and an output (11c);

· a resistor (12) having a first end (12a) connected to the inverting input (11a) of said first operational

amplifier (11) and a second end (12b) set to receive an input signal (Vs);

· a first connecting branch (15) having a first end (15a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (15b) connected to the output (11c) of said first operational amplifier (11);

- a second stage (20) provided with:

· a second operational amplifier (21), having an inverting input (21a), a noninverting input (21b) and an output (21c);

· a resistor (22) having a first end (22a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (22b) connected to the output (11c) of said first operational amplifier (11);

· a second connecting branch (25) having a first end (25a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (25b) connected to the output (21c) of said second operational amplifier (21);

- a third stage (30) provided with:

· a third operational amplifier (31) having an inverting input (31a), a noninverting input (31b) and an output (31c);

· a resistor (32) having a first end (32a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (32b) connected to the output (21c) of said second operational amplifier (21);

· a connecting block (33) interposed in circuit between the inverting input (31a) and the output (31c) of said third operational amplifier (31);

- a main feedback branch (50) preferably defined by a resistor (51) and having a first end (50a) connected to the output (31c) of said third operational amplifier (31) and a second end (50b) connected to the inverting

input (11a) of said first operational amplifier (11), characterised in that it further comprises a fourth stage (40) provided with:

- a fourth operational amplifier (41) having an inverting input (41a), a noninverting input (41b) and an output (41c);
- a first resistor (42) having a first end (42a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (42b) connected to a fixed-potential node, preferably a grounded node;
- a second resistor (43) having a first end (43a) connected to the inverting input (41a) of said fourth operational amplifier (41) and a second end (43b) connected to the output (41c) of said fourth operational amplifier (41);
- a first connecting resistor (54) having a first end (54a) connected to the inverting input (21a) of said second operational amplifier (21) and a second end (54b) connected to the noninverting input (41b) of said fourth operational amplifier (41).

193. A filter as claimed in claim 192, characterised in that said first connecting branch (15) is defined by a resistor (13), said second connecting branch (25) comprising a connecting block (23).

194. A filter as claimed in claim 193, characterised in that the connecting block (23) of said second connecting branch (25) is defined by a branch comprising a capacitor and a resistor in series with each other, this branch being connected in parallel to a capacitor or to another branch of the same circuit type as the preceding branch, the connecting block (33) of said third stage (30) being preferably defined by a

single capacitor or a capacitor in series with a resistor, or in that the connecting block (23) of said second connecting branch (25) is defined by a single capacitor or a capacitor in series with a resistor, and in that the connecting block (33) of said third stage (30) is defined by a branch comprising a capacitor and a resistor in series with each other, this branch being connected in parallel to a capacitor or to another branch of the same circuit type as the preceding branch.

195. A filter as claimed in claim 193, characterised in that said connecting blocks (23, 33) are defined either by a single capacitor or by a capacitor in series with a resistor, said filter (1) being also preferably provided with a feedback branch (101) comprising a feedback resistor (102) and having a first end (101a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (101b) connected to the output (11c) of said first operational amplifier (11), and/or with a feedback branch (103) comprising a feedback resistor (104) and having a first end (103a) connected to the output (21c) of said second operational amplifier (21) and a second end (103b) connected to the inverting input (11a) of said first operational amplifier (11).

196. A filter as claimed in anyone of claims 192 to 195, characterised in that the output (41c) of said fourth operational amplifier (41) is connected, preferably in a direct manner, to the noninverting input (31b) of said third operational amplifier (31), and/or in that it also comprises a second connecting resistor (59) having a first end (59a) connected to the inverting input (11a) of said first operational

amplifier (11) and a second end (59b) connected to the noninverting input (41b) of said fourth operational amplifier (41).

197. A filter as claimed in claim 192, characterised in that said first connecting branch (15) comprises a connecting block (13), said second connecting branch (25) being preferably defined by a resistor (23).

198. A filter as claimed in claim 197, characterised in that said connecting blocks (13, 33) are defined by a single capacitor or a capacitor in series with a resistor, said filter (1) being also preferably provided with a feedback resistor (74) having a first end (74a) connected to the inverting input (11a) of said first operational amplifier (11) and a second end (74b) connected to the output (11c) of said first operational amplifier (11), or to the output (21c) of said second operational amplifier (21).

199. A filter as claimed in claim 197, characterised in that the connecting block (13) of said first connecting branch (15) is defined either by a single capacitor or by a capacitor in series with a resistor, and in that the connecting block (33) of said third stage (30) is preferably defined by a branch comprising a single capacitor or a capacitor in series with a resistor, this branch being connected in parallel to another branch comprising a single resistor or a resistor in series with a capacitor.

200. A filter as claimed in claim 192, or anyone of claims 197 to 199, characterised in that the output (41c) of said fourth operational amplifier (41) is connected, preferably in a direct manner, to the

noninverting input (11b) of said first operational amplifier (11), and/or in that it also comprises a second connecting resistor (58) having a first end (58a) connected to the inverting input (31a) of said third operational amplifier (31) and a second end (58b) connected to the noninverting input (41b) of said fourth operational amplifier (41).